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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,353	04/15/2004	Keiichi Sato	0943-0143PUS1	6320

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EXAMINER

MONBLEAU, DAVIENNE N

ART UNIT PAPER NUMBER

2878

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/824,353

Applicant(s)

SATO, KEIICHI

Examiner

Davienne Monbleau

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/15/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The IDS filed on 4/15/04 has been acknowledged and a signed copy of the PTO-1449 is attached herein.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claims 1, 2, 18, and 19, it is not clear whether the heat treatment steps being applied to the adhesive are towards a method of making the fiber optic inspection device which results in a strain; this would not further limit the inspection method itself.

Claims 3-17 and 20-23 are rejected as being dependent on an indefinite base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-17, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ball (U.S. 5,841,034) in view of Applicant's Admitted Prior Art (AAPA).

Regarding Claim 1, *Ball* teaches in Figures 1 and 3 a bond separation inspection method comprising a step of joining together two members (2, 4) with an adhesive (6), a step of embedding a sensor part (28) of an optical fiber sensor (26) in the adhesive (6), a step of detecting separation of the bond of the two members (2, 4) on the basis of an optical characteristic of the light from the sensor part (28), wherein the step of embedding the sensor part (28) in the adhesive (6) includes a step of causing a strain (through load 10) to arise in the sensor part (28). *Ball* further teaches in column 4 lines 2-11 the principle of using a fiber optic grating and reflectometry. It is inherent that light from a light source is introduced into one end of the optical fiber sensor (26). *Ball* does not teach causing light from the sensor part to emerge from another end of the optical fiber sensor (26). *AAPA* (spec. pages 1-2) teaches that detection with fiber optic sensors may use either reflected or transmitted light (i.e. light emerging from another end of the optical fiber). It would have been obvious to one of ordinary skill in the art at the time of the invention to use transmitted light in *Ball*, as taught by *AAPA*, to measure different characteristics of the fiber sensor and still maintain accurate strain measurements.

Regarding Claim 11, *Ball* teaches in Figures 1 and 3 a bond separation inspection method comprising a step of joining together two members (2, 4) with an adhesive (6), a step of embedding a sensor part (28) of an optical fiber sensor (26) in the adhesive (6), a step of detecting separation of the bond of the two members (2, 4) on the basis of an optical characteristic of the light from the sensor part (28), and a step of applying a predetermined load

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(10) to the two members (2, 4). *Ball* further teaches in column 4 lines 2-11 the principle of using a fiber optic grating and reflectometry. It is inherent that light from a light source is introduced into one end of the optical fiber sensor (26). *Ball* does not teach causing light from the sensor part to emerge from another end of the optical fiber sensor (26). *AAPA* (spec. pages 1-2) teaches that detection with fiber optic sensors may use either reflected or transmitted light (i.e. light emerging from another end of the optical fiber). It would have been obvious to one of ordinary skill in the art at the time of the invention to use transmitted light in *Ball*, as taught by *AAPA*, to measure different characteristics of the fiber sensor and still maintain accurate strain measurements.

Regarding Claims 3 and 14, *Ball* teaches in column 4 lines 2-4 that the optical fiber sensor (26) is an optical fiber grating sensor.

Regarding Claims 4 and 15, it is inherent that a light source must be used with the fiber optic sensor, but *Ball* does not teach a particular light source. *AAPA* teaches (spec. page 1) using a broadband light source. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a particular light source in *Ball*, as taught by *AAPA*, to have a wide range of detection wavelengths and thus receive more strain-dependent data.

Regarding Claims 5 and 16, *Ball* teaches in column 4 lines 2-11 that the optical characteristic is an optical characteristic of reflected light reflected in the sensor part.

Regarding Claims 6 and 17, *Ball* teaches reflectometry but does not teach transmitted light. *AAPA* (spec. pages 1-2) teaches that detection with fiber optic sensors may use either reflected or transmitted light. It would have been obvious to one of ordinary skill in the art at the

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time of the invention to use transmitted light in *Ball*, as taught by *AAPA*, to measure different characteristics of the fiber sensor and still maintain accurate strain measurements.

Regarding Claims 7, 9, 20, and 22, *Ball* teaches in column 4 lines 2-11 reflectometry, which measures spectral characteristics of light.

Regarding Claims 8, 10, 21, and 23, *Ball* teaches in column 4 lines 2-11 measuring a characteristic of the light, but does not teach that it is a strength characteristic. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to measure a strength characteristic of the light at a predetermined wavelength to determine the related proportion of strain, and thus deformation of the bond.

Regarding Claim 12, *Ball* teaches in Figure 1 that the predetermined load is a load applied to the two members (2, 4) in a direction such that it tends to increase any separation of the bond.

Regarding Claim 13, *Ball* teaches in Figure 1 that the step of applying a load (10) is a step of applying external forces but does not teach that that it deforms the two members elastically (2, 4). It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a particular adhesive that may be deformed elastically so that the adhesive will recover its size and shape after deformation. One of ordinary skill in the art would be able to choose the appropriate adhesive material for its specific application based on the materials that need to be bonded via the adhesive.

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Claims 2, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ball in view of AAPA, as applied to claims 1 and 11 above, and further in view of Chen et al. (U.S. 6,668,105).

Regarding Claims 2 and 18, *Ball* teaches applying a strain, via load (10), but does not teach that the strain may be carried out using a thermosetting adhesive as the adhesive and hardening the adhesive at a temperature higher than room temperature and then returning it to room temperature. *Chen* teaches in column 7 line 65 to column 8 line 6 a that is common to use hot curing adhesives to mount strain gages, such as a fiber optic strain sensor. *Chen* further states that these adhesives often have compression strains when the specimens are allowed to cool after the adhesive is heat cured at an elevated temperature. It would have been obvious to one of ordinary skill in the art at the time of the invention to use hot curing adhesives in *Ball*, as taught by *Chen*, as another means to create a strain in the sensor part.

Regarding Claim 19, *Ball* teaches an adhesive (6) but does not teach that said adhesive (6) hardens at room temperature. *Chen* teaches in column 7 line 65 to column 8 lines 1-6 that room-temperature curing adhesives are commonly used to mount strain gages, such as a fiber optic strain sensor. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a room-temperature curing adhesive in *Ball*, as taught by *Chen*, to provide a sufficient material to mount the fiber sensor.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure because they teach various configurations of fiber optic strain sensors.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 571-272-1945.

The examiner can normally be reached on Mon-Fri 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Davienne Monbleau
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